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WEST AMERICAN CHAMIDAE, PERIPLOMA AND GLYCYMERIS

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Having recently reviewed the West American Chamidae in the collection of the Academy of Natural Sciences and the Lowe collection, we think that a list of the species we consider valid may be of interest. In place of bibliographic references we may mention here that Broderip's species were first fully described and illustrated in the Transactions of the Zoological Society of London, vol. I, 1835; afterward, with some changes, in Reeve's Conchologia Iconica, vol. IV, 1846-7, where Reeve also made some additions to the list.

1. CHAMA BUDDIANA C. B. Adams (Panama Cat. p. 253, 1852, Guaymas and Panama). A well marked species with irregular whitish subtubular spines on a reddish ground, the interior white. We have seen it from as far north as Concepcion Bay, Lower California. "*Chama ? frondosa* var. *fornicata*" of Carpenter's Mazatlan Catalogue was said by him in 1863 to be identical with *buddiana*.

2. CHAMA FRONDOSA Brod. Type loc., Isle of La Plata, W. Colombia. The typical form with broad, frond-like spines, as in Tr. Zool. Soc., pl. 38, fig. 1, and Reeve, fig. 1a, seems to be exceedingly rare northward; single specimens were taken by one of us at the Tres Marias, Cape St. Lucas and La Paz. Tryon (Proc. A. N. S. Phila., 1872, p. 117) placed *Chama purpurascens* Conrad as a synonym of *frondosa*. So far as we know, Conrad never described this form. His specimens, in the collection of the Academy, are the var. *mexicana* Cpr.

3. CHAMA FRONDOSA MEXICANA Cpr. (Mazatlan Cat., 1855, p. 87) is the var. *b* of Reeve, pl. 1, fig. 1*b*, described from the Gulf of Tehuantepec. This seems to be the common form along the west Mexican coast including the Gulf of California. It grows to huge proportions and is often riddled by boring mollusks and covered with marine growths until none of the original sculpture is visible. Carpenter's minute shells "from Chama and Spondylus washings" were doubtless from this species. Probably the unfigured *Chama parasitica* Rochebrune (Bull. Mus. Nat. Hist. Paris, I, 1895, p. 243) is this form. It was found on submerged branches of mangrove in the "Lagunes de l'île San José."

4. CHAMA ECHINATA Brod. Type loc., Puerto Portrero, C. A. It is common along the Mexican coast, where the attached lower valves are often conspicuous by their purple interior and light coral red hinge, this bizarre color combination making even a worn valve easily recognizable. Reeve's pl. 7, fig. 35, is evidently a young shell with spines in perfect condition. His *Chama coralloides*, from the type locality of *echinata*, has been considered a worn specimen of this species.

5. CHAMA PELLUCIDA Sowb. (See Tr. Zool. Soc. I, p. 302, pl. 38, fig. 3). Type loc., Iquiqui, Peru; has been reported as far north as Oregon. Young specimens have sometimes been identified erroneously as *C. spinosa* Brod., a species which does not occur on the west American coast.

6. CHAMA SORDIDA Brod. Type dredged by Cuming in 18 fathoms at the Island of Cuña, Central America. The only specimens taken by the junior author were brought up by a tangle in 15 fathoms off Carmen Island, Gulf of California, with Spondylus and *Arca pacifica*. It is a very well marked species of uniform reddish color, with irregularly spaced stout spines.

7. CHAMA SQUAMULIGERA Pils. & Lowe. (Proc. A. N. S. Phila., 1932). Has been taken at San Juan del Sur, Nicaragua; Manzanillo, Mazatlan, Tres Marias and Cape St. Lucas. This small delicately spinose shell was formerly

often identified as *C. spinosa* Brod. by West Coast conchologists.

8. CHAMA VENOSA Reeve. Type loc. unknown. So far as we know, it has been taken only in Gulf of California. Our specimens were found on piling of an old wharf at Ensenada de los Muertos. According to Lamy a synonym of this species is *Chama digueti* Rochebrune, 1895, l. c. p. 243, which came from "Lagunes de l'île San José," and is said to be related to *C. fibula* Rve. It has not been figured, measures 35 x 17 mm., and is striolate with brown and rose.

PSEUDOCHAMA Odhner.<sup>1</sup> These are the "inverse" chamas, attached by the right valve. It was formerly believed that the same species might be attached by either valve, with corresponding inversion of the hinge teeth analogous to dextral and sinistral gastropods; but according to Odhner, "no case of real inversivity among the Lamelli-branchs is known . . . nothing but slight dislocations of the hinge elements."<sup>2</sup> *Chama* and *Pseudochama* are thought by Odhner to be descendants of sinistral and dextral stocks of *Diceras*, respectively.

PSEUDOCHAMA INERMIS (Dall.). (Amer. Journ. Conch., vol. 7, p. 148.) In the original description this shell is said to measure 3.1 x 2.1 inches. It is rugged, sinistral, obscurely three-sided; smooth except for the lines of growth, covered with a strong, light yellow epidermis. Interior white; margin smooth; the posterior edge of the left valve with a narrow band of purple, etc.

The junior author on examining the type (No. 24108 U. S. N. M.) when in Washington in October, was reminded of the Australian *Chamostrea*. The total absence of spines and the strong, wrinkled, buff epidermis is like no other *Chama* of our coast. The following note by Dr. Carpenter is in the tray: "I wrote a diagnosis of this queer shell as *Chama inermis*, but have suppressed it as it may be a queer

<sup>1</sup> Nils Hj. Odhner, "Studies . . . of Recent Chamidae," in Kungl. Sv. Vet. Akad. Handl., Bd. 59, No. 3, p. 20. Type *Chama exogyra* Conr.

<sup>2</sup> Loc. cit. p. 8. See also in this connection: W. F. Popenoe and W. A. Findlay, "Transposed hinge structures in Lamelli-branchs," in Trans. San Diego Soc. N. H., vol. 7, p. 301. 1933,

growth of something else. It is certainly not Puget Sound from the parasites, which are tropical. It is not unlike *C. iostoma* Conr., worn smooth."

Rev. J. Rowell presented the specimen, with the locality "Puget Sound." He went to California by way of Panama. Dall gave the locality "Central America," but he had no information save that given by Rowell and Carpenter. Though described over 60 years ago the species does not appear to have been collected again until 1930, when one of us (H. N. L.) found a specimen on Maria Madre Island of the Tres Marias group. This shell, figured in Plate 8, figs. 1-3, measures 47 x 67 mm., diam. 32 mm., being smaller than the type. The periostracum is from cream buff to cinnamon buff, with a wide crescentic streak of purple on the upper valve. The interior is white with olive-buff muscle scars. This is the first authentic habitat for one of the most distinct of all chamas, as the other localities assigned were mere guesses.

10. *PSEUDOCHAMA CORRUGATA* (Brod.). Type loc., Real Llejos. The only specimens taken were on rocks in Montijo Bay, R. P. It is readily recognized by the dark purple interior with white border.

11. *PSEUDOCHAMA EXOGYRA* (Conrad). Upper California (Journ. A. N. S. Phila., vol. 7, p. 256). Very common on the California coast, and reported as far south as Panama.

A closely allied but apparently distinct small species has been dredged in deep water by H. N. L. and others off Catalina Island. It will shortly be described by A. M. Strong.

12. *PSEUDOCHAMA JANUS* (Reeve). Galapagos Islands, Cuming. Known only from the type locality, where one of us took specimens at Seymour Bay, Indefatigable Island (Pinchot Exped.). The two patterns of sculpture on the upper valve (which suggested the name) make it easy to recognize, even in very dead specimens.

13. *PSEUDOCHAMA PANAMENSIS* (Reeve). Panama, Cuming. We have not seen this species, although both of us collected at Panama.

*ECHINOCHAMA* comprises a few nearly equivalent species

with small or transitory attachment, otherwise allied to *Pseudochama*.

14. ECHINOCHEMA CALIFORNICA Dall. Gulf of California. One of us dredged this in 20 fathoms off Manzanillo and off Acapulco, one specimen considerably larger than the type. It is a very rare form, seldom seen. This is the species reported from Panama as *Chama arcinella* L. (the common West Indian species), collected by the St. George Expedition.

*Species reported in error from West America*

*Chama iostoma* Conrad is a Hawaiian species.

*Chama imbricata* Brod. From "Lord Hood's Island" = Marutea, Tuamotu Group.

*Chama spinosa* Brod. Same locality. (= *C. asperella* Lam., a widely spread species of Australia, East Indies and Polynesia.)

*Chama pacifica* Brod. Lord Hood's Island = Marutea, Tuamotus.

*Chama broderipi* Rve. Same locality.

#### PERIPLOMA ALTA C. B. Adams

This Panamic species has been placed in the synonymy of *P. planiuscula* Sowb. by several authors, but it is really a distinct and valid species. It is much more closely related to *P. discus* Stearns, from which it differs by the larger size and the outline of the posterior end. The mistake arose from a typographical error in Adams' description, the "height 1.35 inch" should read 1.55 inch. The type specimen is a single left valve, still preserved in the Amherst collection, with Adams' autograph label.

Whether *P. lenticularis* Sowb. is specifically identical with *P. planiuscula* cannot be affirmed without an examination of the type, which has not been figured.

#### GLYCYMERIS DELESSERTI (Reeve)

This species, of which the locality was unknown to Reeve, was collected at Maria Madre, Tres Marias Islands, in excellent, typical specimens during the Lowe trip of 1929. It

is a handsome shell, related to *G. inaequalis* Sowb., but having many more primary ribs. It was reported as *G. assimilis* in Proc. A. N. S. Phila., 1932, p. 141. In *G. deserti* the radial ribs are cut by deep radial grooves into little ridges, which are crenulated by concentric furrows, this being especially marked on the outer ridges of each rib. The spaces between ribs do not have radial grooves. In *G. inaequalis* the radial grooves are as well developed in the intervals as on the ribs.

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### SOME WESTERN FRESH WATER MOLLUSKS

BY JUNIUS HENDERSON

*HELISOMA OCCIDENTALE* (Cooper). Pl. 9, fig. 1. This species was briefly described by Cooper, without figure, in 1870. He designated no type and no type locality, but gave its range as from Washington to Kern Lake and San José, California. His description and measurements, with his statement that it has been called both *trivolis* and *tenuis*, and his subsequent statement (1890) that "many intermediate forms now prove that it is only the mature form of *P. tumens*," indicate that he confused two very different forms; but anyone who has examined large collections of *Helisoma* from California can see how he should have been so confused. His material is said to have been destroyed. Hence it is desirable to select a neotype. A form which could have furnished the basis for his description is common at Klamath Lake, Oregon. He probably had specimens of *Helisoma* from there, as he mentioned other species of mollusks from that lake. I have selected as neotype a specimen from Klamath Lake, No. 17737-a, University of Colorado Museum, which I figure, together with two others in the same collection from the same place. The neotype measures 27.5 mm. in diameter and 15 mm. in altitude just back of the slightly everted lip, approximating Cooper's maximum measurements. The last whorl is not carinate,